

Mathematics of Flight

Altitude and Atmospheric Pressure



Altitude & Atmospheric Pressure

What is an Altimeter?



An altimeter indicates the airplane's altitude over **sea level, not the ground**

Altitude & Atmospheric Pressure

What is an Altimeter?



The long white hand points to altitude in hundreds of feet

The short white hand points to altitude in thousands of feet

If there is a third long and thin needle, it points to tens of thousands of feet

Altitude & Atmospheric Pressure

Example:

If the altimeter setting changed from 30.18" to 29.76", then what is the change in altitude?

Solution:

$$30.18'' - 29.76'' = 0.42''$$

Altitude & Atmospheric Pressure

Example:

If the altimeter setting changed from 30.18" to 29.76", then what is the change in altitude?

Solution:

$$\frac{1''}{1000'} = \frac{0.42''}{X}$$

$$1'' \cdot X = 1,000 \cdot 0.42$$

$$X = 420 \text{ feet lower}$$

Altitude & Atmospheric Pressure

Exercise 1:

If the altimeter setting changed from 29.25" to 29.85", then what is the change in altitude?

Solution:

$$29.25'' - 29.85'' = 0.60'' \text{ increase}$$

Altitude & Atmospheric Pressure

Exercise 1:

If the altimeter setting changed from 29.25" to 29.85", then what is the change in altitude?

$$29.25'' - 29.85'' = 0.60'' \text{ increase}$$

Solution:

$$\frac{1''}{1000'} = \frac{0.60''}{X}$$

$$1'' \cdot X = 1,000 \cdot 0.60$$

$$X = 600 \text{ feet higher}$$

Altitude & Atmospheric Pressure

Exercise 2:

Setting changed from 30.30" to 29.51". What is the approximate change in altitude? (Hint: Notice if an increase or decrease.)

Solution:

$$30.30'' - 29.51'' = 0.79$$

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Exercise 2:

Setting changed from 30.30" to 29.51". What is the approximate change in altitude?

$$30.30'' - 29.51'' = 0.79$$

Solution:

$$\frac{1''}{1000'} = \frac{0.79''}{X}$$

$$1'' \cdot X = 1,000 \cdot 0.79$$

$$X = 790 \text{ feet lower}$$

Altitude & Atmospheric Pressure

Exercise 3:

Setting changed from 30.00" to 29.47". What is the approximate change in altitude? (Hint: Notice if an increase or decrease.)

Solution:

$$30.00'' - 29.47'' = 0.53$$

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Exercise 3:

Setting changed from 30.00" to 29.47". What is the approximate change in altitude? (Hint: Notice if an increase or decrease.)

$$\frac{1''}{1000'} = \frac{0.53''}{X}$$

$$1'' \cdot X = 1,000 \cdot 0.53$$

$$X = 530 \text{ feet lower}$$

More Resources

**Additional Resources
are available online at**

www.nationalmuseum.af.mil/education/teacher/index.asp